Return to Master Directory

EXECUTIVE SUMMARY

INTRODUCTION

On September 2, 2003, Vermont Electric Power Company, Inc. (VELCO), filed an application with the U.S. Department of Energy (DOE) to amend two Presidential Permits (PP-66 and PP-82) for the construction, operation and maintenance of electrical facilities that cross the United States-Canada border in two places within Vermont: Derby Line (the "Derby Interconnection Facilities") and Franklin (the "Highgate Interconnection Facilities," so named because of the location in Highgate, Vermont, of the interconnection's terminal). The Secretary of Energy has the authority to grant or deny such amendments with concurrence by the Secretary of Defense and the Secretary of State.

Proposed Action

The Northern Loop Project proposed by VELCO involves upgrades in Vermont at three existing substation[1] locations (St. Johnsbury, Irasburg and Highgate), additional line equipment at two tap[2] points (Mosher's Tap in Newport and the St. Albans Tap) and an upgrade of an existing 6.47-mile, 48-kilovolt (kV) transmission line, located between VELCO's Irasburg Substation

---

1 "Substation" means a structure, usually a small building on a fenced-off lot, that contains any combination of routing or cutoff switches, transformers, surge arresters, capacitors, power conditioners and other equipment needed to ensure smooth, safe flow of current. Substations are most commonly seen in residential and industrial areas, where one or more high-voltage lines can often be feeding into the station and any number of lower-voltage distribution lines spider out to serve customers in the surrounding area (Ref.: www.energyvortex.com).

2 A "tap" broadly refers to any terminal where an electric connection is established and most commonly refers to a terminal or connection that draws a certain amount of current from part of a circuit. Tapping a circuit can refer either to running a line or cable from a point in a circuit or to the drawing of electricity from that circuit. Just as a water tap allows one to draw a certain amount of water from the total supply, an electrical tap serves the same function for drawing electricity from a source of supply (Ref.: www.energyvortex.com)

.

and Mosher's Tap, to accommodate a new 115-kV transmission circuit (see Figure ES-1 below). Power flows on the Derby Line and Highgate Interconnection Facilities may change, and the Highgate Interconnection would be tapped to allow VELCO to supply customers of Vermont Electric Cooperative, Inc. (VEC), located in northwestern Vermont, from sources of supply in Québec.

With these upgrades, VELCO proposes to integrate most of an existing, 120-kV, Derby-to-Highgate line, formerly owned by Citizens Communications Corporation (Citizens), into the VELCO system. Once connected, the 120-kV line, which would now be operated at the 115-kV voltage that is used on VELCO's system and the rest of the Northeast power grid, would convert radial transmission lines[3] in northern Vermont into a loop[4] between VELCO's Georgia Substation and the Public Service Company of New Hampshire substation located in Littleton, New Hampshire.

VELCO's Purpose and Need

VELCO's primary purpose for the Northern Loop Project is to improve reliability in northern Vermont by eliminating two radial electrical feeds, currently used to serve approximately 80 megawatts (MW) of load in northern Vermont supported by VELCO's system, by connecting VELCO's existing 115-kV lines terminating in Irasburg and Highgate with the existing 120-kV line, formerly owned by Citizens, between Highgate and Newport, Vermont. Approximately 35

3 "Radial line" refers to a transmission line, distribution line or transmission/distribution subsystem that is not interconnected with other systems named because it radiates outward from another transmission system without bridging any other system (Ref.: www.energyvortex.com).

4 In the energy industry, a "loop" is a distribution or transmission circuit supplied by two sources of energy. One source serves as a back-up in case the primary source of energy is interrupted (Ref.: www.energyvortex.com).

MW of the load served by this line at Highgate Substation will be connected to the new, looped facilities. These now-looped facilities will also provide a back-up source of supply to the remaining radial portion of the load: approximately 35 MW served from Newport Substation and supplied from Québec over the Derby Interconnection Facilities.

A detailed explanation of the proposed project, complete with figures, is provided below ("Overview of the Proposed Action").

Environmental Review Process

NEPA Document

DOE is the federal lead agency for evaluating the Northern Loop Project under the National Environmental Policy Act (NEPA). As required by NEPA, this Environmental Assessment (EA) examines the expected individual and cumulative impacts of the project. The EA also identifies means to minimize potential adverse impacts (mitigation measures) and presents an evaluation of reasonable alternatives to the proposed project, including the "No Action" alternative.

This EA is designed to provide the public and responsible agencies with information about the proposed project and its potential effects on the local and regional environment. This EA was prepared in compliance with NEPA requirements.[5]

---

[5] Sec. 1508.9 of the President's Council on Environmental Quality's Regulations for Implementing NEPA states that:"Environmental assessment":

(a) Means a concise public document for which a Federal agency is responsible that serves to:
    1. Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.
    2. Aid an agency's compliance with the Act when no environmental impact statement is necessary.
    3. Facilitate preparation of a statement when one is necessary.

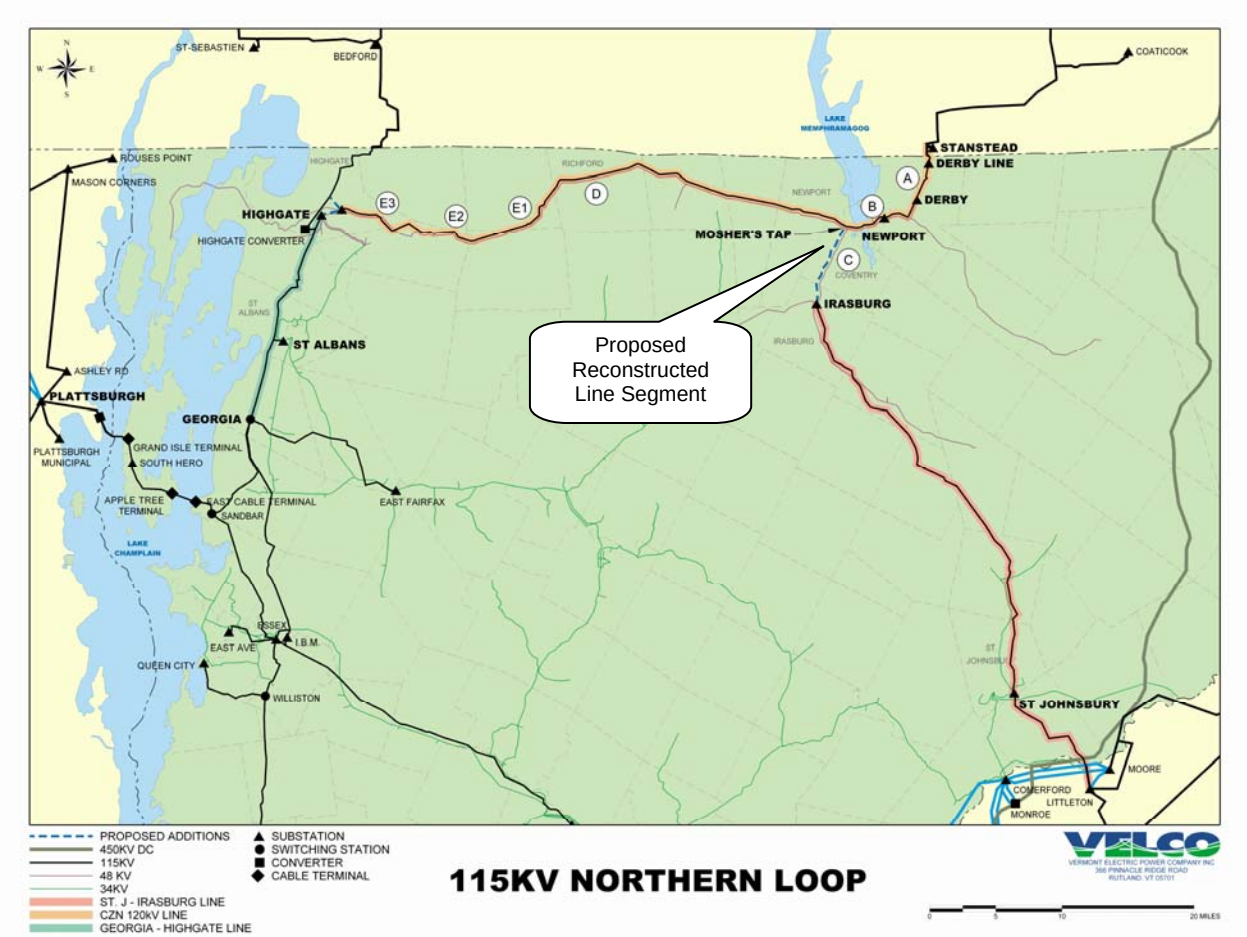
OVERVIEW OF THE PROPOSED ACTION

The electric system in northern Vermont (that portion essentially north of a line drawn from VELCO's Georgia Substation in the western portion of Vermont to a substation in the east located in Littleton, New Hampshire) is currently served by a potentially unreliable transmission system. The total load of approximately 150 MW in that area is supplied by two 115-kV and one 120-kV radial lines and a weak underlying 34.5-kV and 46-kV sub-transmission network. At intermediate-to-peak levels of electrical load, a loss of the 115/120-kV lines results in the inability to serve the entire electrical load in the area. The Northern Loop Project, as described in this EA, will substantially reduce or eliminate the loss-of-load exposure that exists today.

The three radial 115/120-kV lines are shown geographically in Figure ES-1 and schematically in Figures ES-2 through ES-5 (showing the current configuration of the three radial lines).

(b) Shall include brief discussions of the need for the proposal, of alternatives as required by section 102(2)(E), of the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted.

Figure ES-1

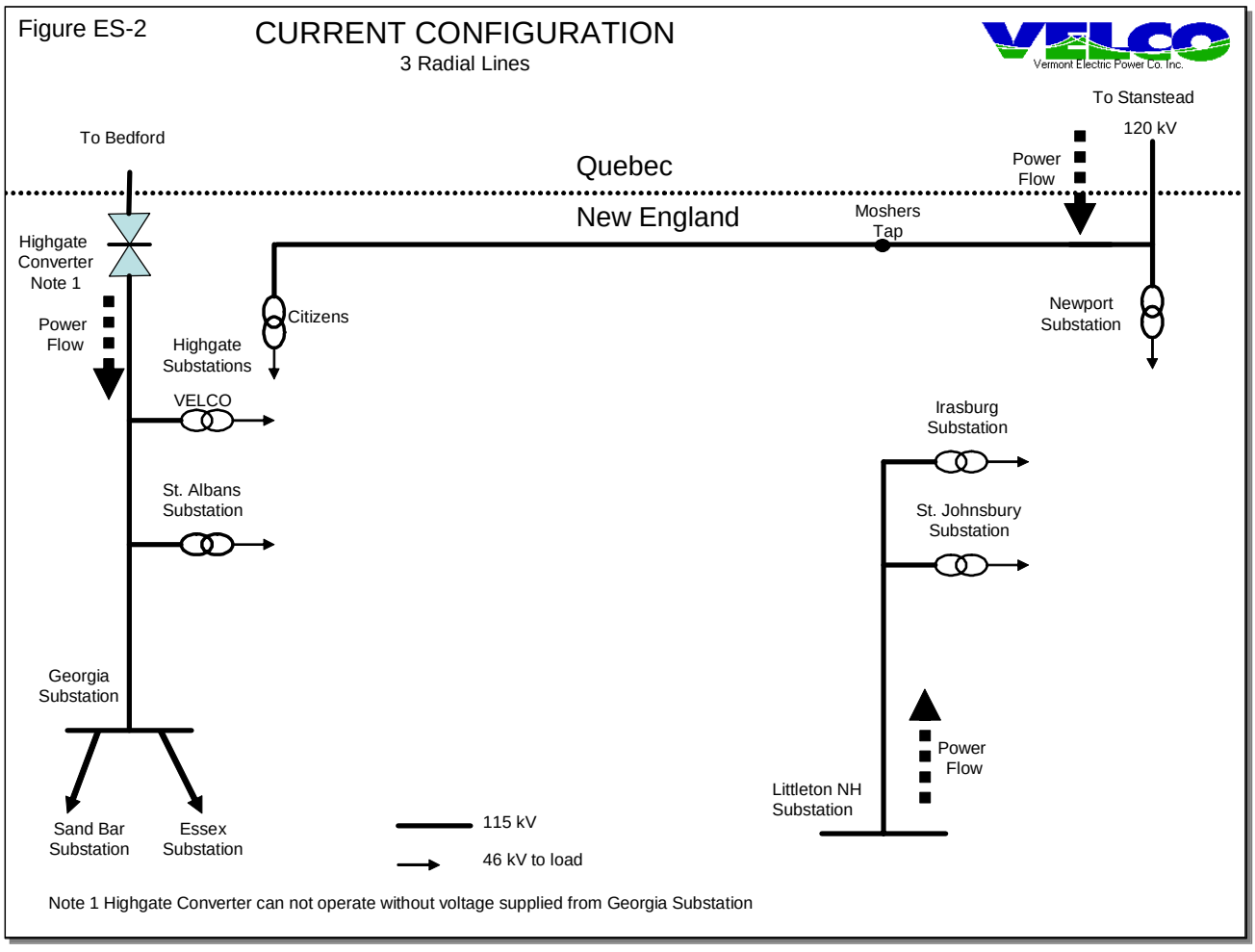


Beginning on the western side of the state and working clockwise around the northern Vermont area, the first radial line begins at Georgia Substation and terminates at the VELCO Highgate Substation. This line provides a voltage source for the Highgate Converter Station tap and serves the electrical load and generation at the VELCO Highgate and St. Albans Substations. A loss of this line renders the Highgate Converter Station inoperable and therefore interrupts a significant (normally up to 200 and as much as 225 MW) source of electrical supply to Vermont via the Highgate Interconnection Facilities from Bedford, Québec.

The next radial line terminates at the former Citizens (now VEC) Highgate Substation and extends easterly across the top of the state to the Derby Interconnection Facilities terminating at the border at Stanstead, Québec. This line serves electrical load at the VEC Newport and Highgate Substations and is commonly referenced as the "block load," which means that the load served by this line is isolated from the New England system and directly connected to the Québec system.

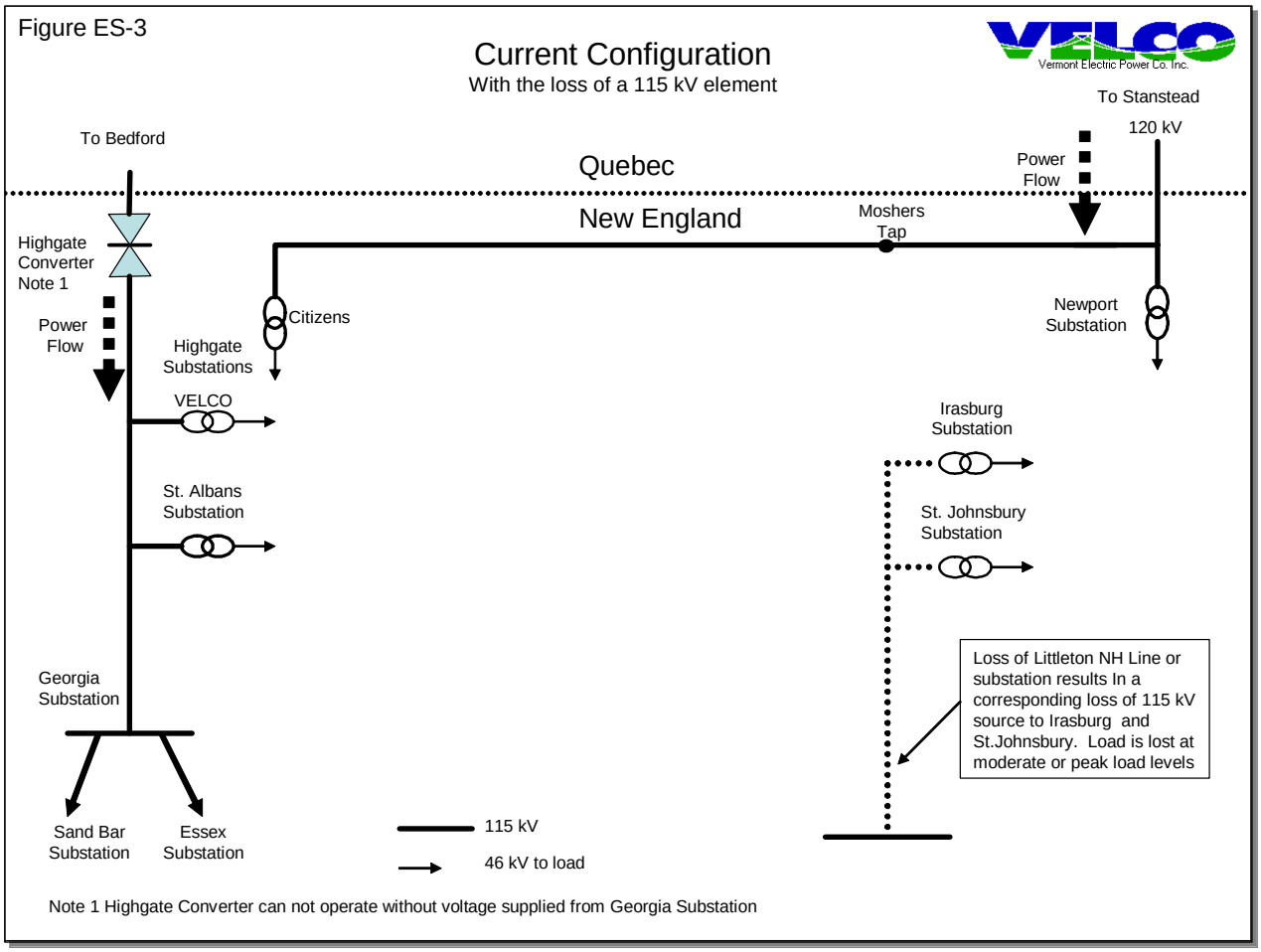
The third radial line terminates at VELCO's Irasburg Substation and is supplied out of Littleton, New Hampshire. This line serves the St. Johnsbury and Irasburg Substation electrical loads.

Figure ES-2 shows these radial-transmission lines in their current configuration schematically:



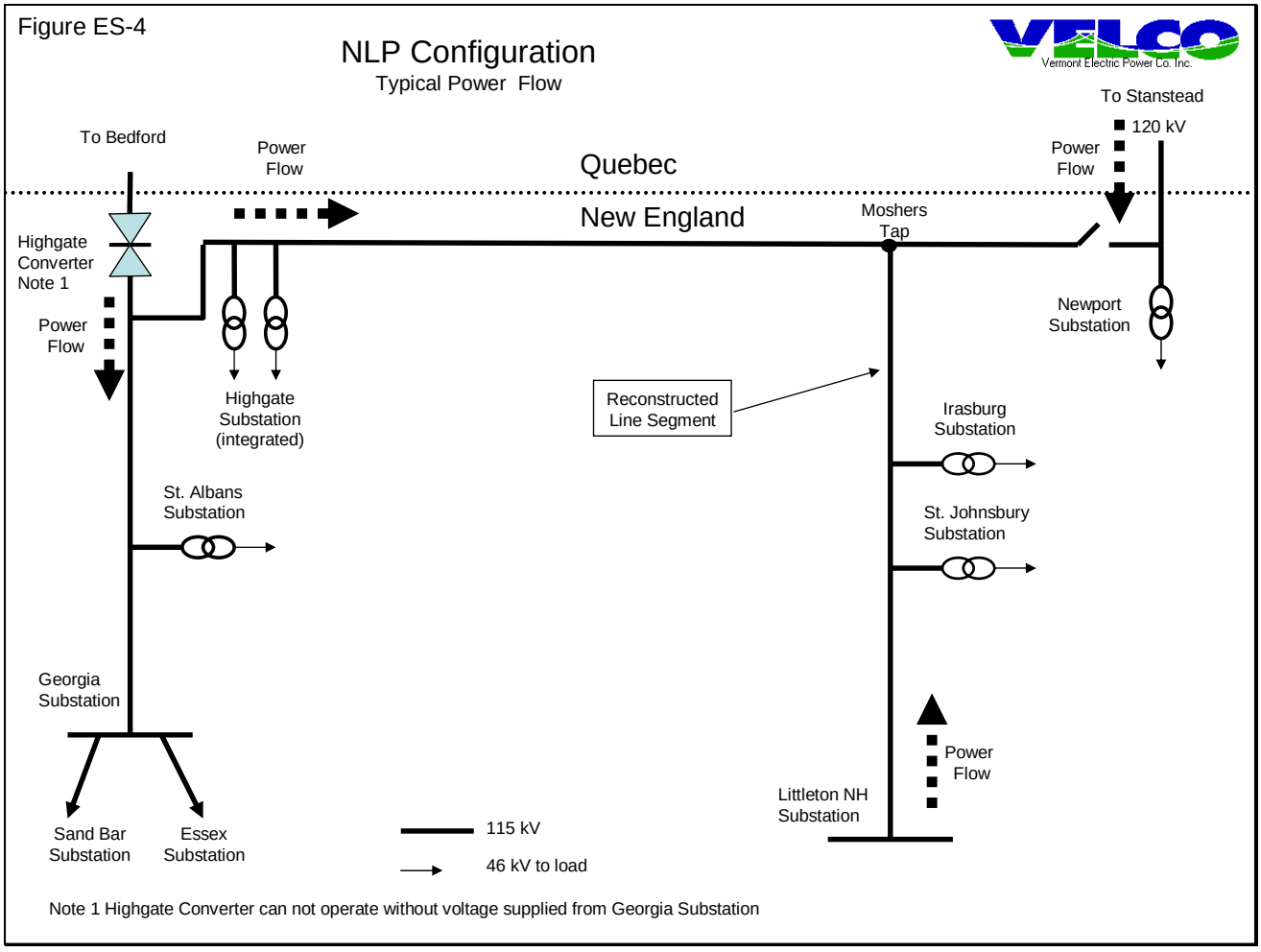
At intermediate or higher load levels, some portion of the load served by these lines cannot be served if the line is out since the underlying sub-transmission network is not sufficiently strong to support the entire load. **Figure ES-3** (Current Configuration with the loss of a 115 kV source element) demonstrates the results for a loss of the 115-kV line supplying the Irasburg and St. Johnsbury Substations. In this example, load would be shed[6] in the St. Johnsbury area under intermediate- or high-load conditions.

Figure ES-3



6 "Shed" means blocking of customer access to energy, usually due to a temporary shortage of supply. Load shedding is rare and is most commonly applied during times of emergency or severe shortage. In most cases, the first loads a utility will shed in these conditions are loads required by industrial and commercial customers. Institutional loads are typically the last to be shed since public institutions (hospitals, schools, municipal-lighting authorities, etc.) are considered to be a utility's most essential customers (Ref.: energyvortex.com).

Figure ES-4 describes the system configuration after the project is constructed:



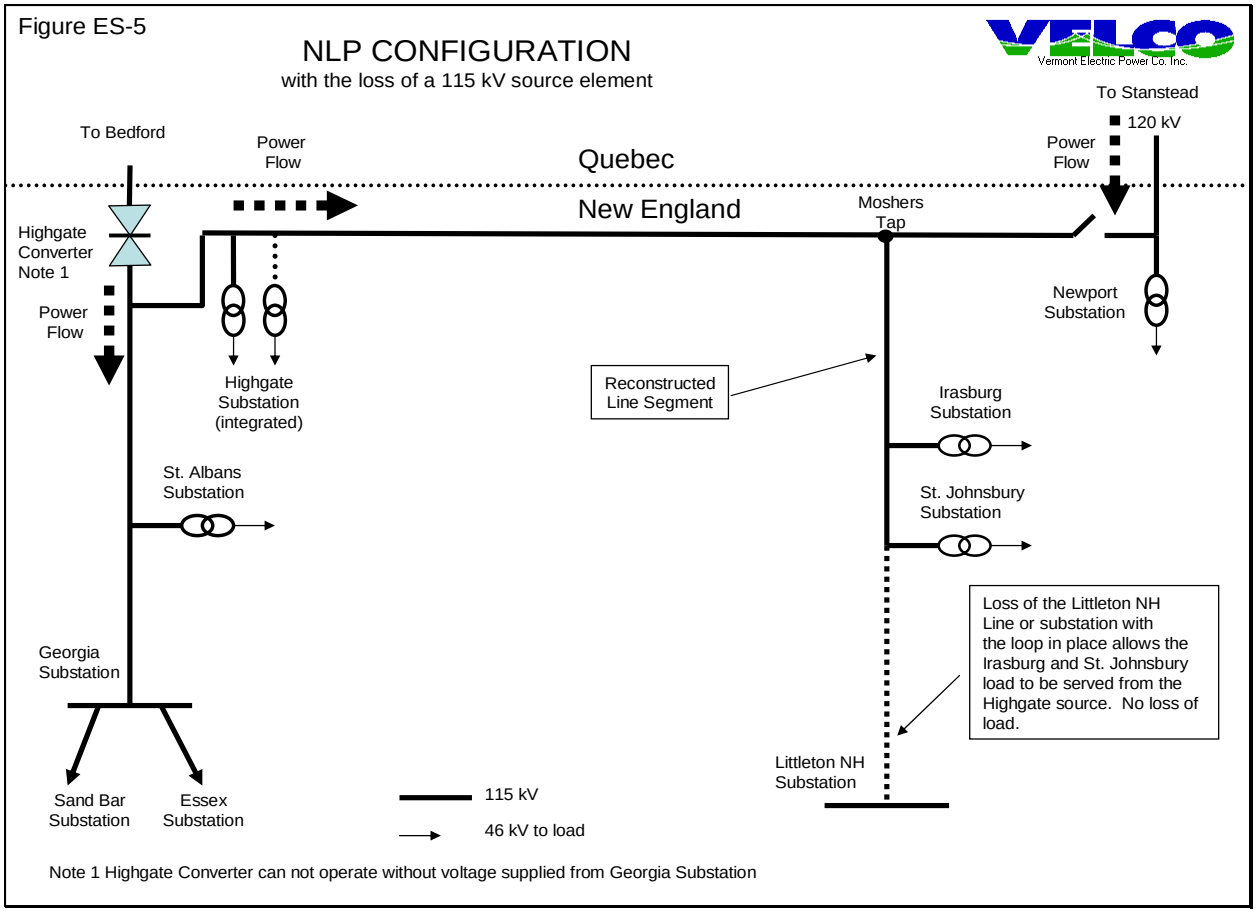
The project will convert the three radial transmission lines into a loop configuration providing a 115-kV backup source for all but 35 MW of the peak load in northern Vermont. The primary elements of the project include:

1. The replacement of an existing, 48-kV transmission line between Irasburg Substation and Mosher's Tap on the Newport-to-Highgate line with a single-pole, double-circuit, 115-kV/48-kV line;

2. Integration of the collocated Highgate VELCO and former Citizens Substations to facilitate the connection of the Newport-to-Highgate line to the Georgia-to-Highgate line; and

3. Upgrades at the existing St. Albans Tap, Irasburg and St. Johnsbury Substations to facilitate the isolation of electrical faults (interruptions of energy flows) on the line segments.

Figure ES-5 (NLP Configuration with the loss of a 115 kV source element) describes the performance of this system for the same loss of the Littleton-to-St. Johnsbury line described in Figure ES-3:



In this example, the reconfigured network provides a 115-kV, back-up source for the Irasburg and St. Johnsbury Substations via the transmission loop to Highgate, therefore eliminating the loss of load in the St. Johnsbury area previously described. This configuration also provides a 115-kV backup source for the remaining radial load served at Newport Substation if its supply from Québec is interrupted.

ALTERNATIVES TO THE PROJECT

Definition of Alternatives

Section 1508.9(b) of The Council of Environmental Quality regulations for implementing NEPA (40 CFR Parts 1500 – 1508) requires that an EA "Shall include brief discussions…of alternatives as required by §102(2)(E) [of NEPA], of the environmental impacts of the proposed action and alternatives …" The above-cited §102(2)(E) of NEPA requires that the agency "study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."

DOE has considered various alternatives for the project through the EA process, including evaluation of issues raised during the EA's development. VELCO also considered a variety of alternatives in developing its proposal.

Alternatives Considered But Eliminated

The alternatives considered included:

- The construction of sufficient generation in northern Vermont that, coupled with the existing transmission system, could serve electrical load with the same reliability that would be achieved by the project–this alternative was eliminated from further consideration because of higher costs than the proposed project and significant environmental impacts, such as atmospheric emissions;
- Investments in conservation and efficiency measures that, coupled with the existing transmission system, could serve electrical load with the same reliability that would be achieved by the project–this alternative was eliminated from further consideration because of significantly higher costs than the proposed project and because such measures would have to eliminate more than half of existing, peak-electrical requirements to achieve the same reliability benefits of the proposed project;
- Locating the proposed Irasburg-to-Mosher's Tap line in a partially or entirely new corridor–this alternative was found to be viable; however, it was determined that the potential environmental impacts are in excess of those that could result from the preferred alternative within an existing right-of-way corridor, and hence the alternative is not desirable; and
- Reducing the capacity of the conductor, reducing the spacing between poles or changing the structure design for the Irasburg-to-Mosher's Tap line to reduce the power line's size and height–this alternative was eliminated from further consideration because it would have greater environmental impacts as compared to the proposed project—for example, more poles with associated visual and excavation impacts—and less capacity to meet

future electrical requirements, potentially requiring the line to be rebuilt in the near future with associated further environmental impacts.

No Action Alternative

Under the "No Action" alternative, DOE would deny the amendment requested by VELCO to Presidential Permits PP-66 and PP-82. In this case, the proposed project, described above, would not be implemented, and there would be no environmental impacts from construction, etc.

However, VELCO advises that "No Action" could prevent VELCO from proceeding with certain parts of the project by which electricity flows from the Hydro-Québec to the VELCO system (over the facilities authorized by the two Presidential Permits previously issued by DOE). If VELCO were unable to proceed with the project otherwise, significant electrical loads in northern Vermont would continue to be served by the existing radial transmission lines such that the lines' loss would, in many intermediate-to-peak conditions on the VELCO system, likely result in the electrical utilities in northern Vermont supplied by VELCO being unable to serve all customer load (particularly, customer loads occurring in cold winter months). Such inadequate capacity situations could result in "brownout" or "blackout" conditions that, in turn, could result in indirect environmental impacts.

For example, non-functioning traffic signals could cause traffic delays, and hence small amounts of increased atmospheric emissions, from vehicle engines in towns and cities such as St. Johnsbury or Newport. Public institutions, such as hospitals, might have to use back-up generators causing atmospheric emissions.

APPROACH TO ENVIRONMENTAL REVIEW

DOE has conducted a review of the potential environmental impacts that could result from implementation of the project in accordance with the requirements of NEPA, as noted earlier. DOE is required to consider whether the proposal or reasonable alternatives would result in significant impacts on the environment and, if so, what mitigating actions could be implemented to eliminate, avoid, compensate for or reduce those impacts to a less than significant level.

In conducting the environmental review, DOE examined and where necessary verified information provided by VELCO. DOE also examined other environmental reports relevant to power-line and substation impacts on the environment.

Feasible mitigation measures are identified in this EA for potentially adverse impacts; such measures are designed to reduce or eliminate adverse impacts. In several instances, VELCO proposed design features as part of the project that would reduce impacts. VELCO has agreed to implement all design and mitigation measures as part of the project.

AFFECTED ENVIRONMENT

Climate, Meteorology, and Air Quality

The climate in northern Vermont is characterized by cool summers and cold winters. Winter precipitation is usually in the form of snow, with occasional, severe ice-storm conditions.

Air-quality issues in northern Vermont relate primarily to long-distance transport of pollution from industrial facilities, particularly coal-fired power plants in the Midwest. Some pollutants derive from in-state sources. There are no identified air-quality problems at any of the four proposed project sites: Highgate, St. Albans, Irasburg/Mosher's Tap and St. Johnsbury.

Land Features and Use

The project areas are located in different regions of the state. St. Johnsbury is in the eastern Vermont piedmont, with rivers draining into the Connecticut River watershed. The Newport area is in the Lake Memphremagog basin, which drains north to the St. Lawrence River. The Highgate and St. Albans sites are in the Lake Champlain Valley west of the Green Mountains; Lake Champlain flows north to the St. Lawrence River.

Agriculture in Vermont is predominately dairy, with lands devoted primarily to growing feed crops or in pasture. The St. Johnsbury site has no active agricultural use nearby. A portion of the Irasburg-to-Mosher's Tap corridor crosses over areas that are currently farmed. There is no agricultural use in the immediate vicinity of Highgate Substation. St. Albans Tap is in the middle of a small field that is currently cropped with hay.

None of the project sites were found to interfere with forestry or with recreational activities enjoyed in the areas, such as snowmobiling, hunting, fishing, boating and camping. VELCO is working with adjacent landowners to obtain easements where needed. None of the three state airports in proximity to the project are adversely affected by the project.

Hydrology, Water Quality and Water Use

There are no surface waters in the vicinity of the St. Johnsbury facility other than ground water at a depth of five feet. There are several small streams and the Black River in the vicinity of the Mosher's Tap–Irasburg corridor; at its closest point, the corridor is approximately 500 feet distant to the east. Other than dug ditches, the only surface water in the vicinity of the Highgate facility is a dug stormwater pond. There are no surface waters in proximity to the St. Albans Tap site.

Of the four sites, only the Mosher's Tap site is within the 100-year floodplain. However, the proposed use of single-pole power-line structures would not exacerbate flooding; the poles would not impede floodwater movement or reduce floodwater-storage capacity.

None of these four sites lie within a public water-supply area. All of the sites except St. Johnsbury do lie within a potential aquifer-recharge area due to gravel underlayment.

There are no Class One wetlands affected by this project, and there are no identified water-quality problems at any of the four sites.

Ecology

The project is located primarily in the "northern hardwood forest" region of Vermont. The composition of the aquatic and wetland flora of the project area is influenced by the generally cool summer temperatures of the region, water chemistry and nutrient input from runoff.

The tables in Appendix F list species of mammals, birds, amphibians and reptiles that are known or are likely to occur in the various project regions. Habitat maps, published by the Vermont Department of Fish and Wildlife, are also appended in Appendix F. There are no federally-listed endangered species of plants or animals known within or near the project areas. One species that is listed as threatened in Vermont was noted at the Irasburg Substation site: Greene's rush (*Juncus greenei*). However, plants inventoried in 2001 and in July 2003 by VELCO consultants occurred outside the proposed building envelope and will be avoided during construction.

The State of Vermont's Department of Forest, Parks, and Recreation manages 33 designated "natural areas." Of these, none are within one mile of any of the project areas.

Socioeconomics

St. Johnsbury, Irasburg, Coventry, Newport City, Highgate and St. Albans are organized towns and cities in northern Vermont. In 2000, the population of the Town of St. Johnsbury was 7571; Irasburg, 1077; Newport City, 5025; Coventry, 1014; Highgate, 3397; and St. Albans Town, 5324.

The economies of Orleans and Caledonia Counties are closely connected to natural resources. Caledonia County provides a broader array of services and job opportunities. Franklin County has the strongest job growth in Vermont.

On February 20, 2003, public site visits and a public hearing were held by the State of Vermont Public Service Board with regard to the proposed project. No one from the public participated in

the site visits, but several people, including two landowners affected by the project, attended the public hearing. Their main concerns were the aesthetic impact of the new double-circuit line and the electromagnetic-field (EMF) health implications of the new lines.

Visual Resources

In Caledonia and Orleans Counties, the land becomes a rural mosaic of farmland and forests, with concentrated development in the river valleys. The proposed rebuild of the Irasburg-to-Mosher's Tap line will be visible to nearby residences and persons traveling through the area at several locations.

The St. Johnsbury Substation is not visible from Interstates 91 or 93, and it is not visible from Higgins Hill Road where it is located. The Irasburg Substation is located off State Route 14, and it is not visible from the highway. The Highgate Substation is located off State Route 78 and will be visible from Route 78. The St. Albans Tap is not visible from a road.

Cultural Resources

In general, Native American occupation in northern Vermont runs throughout the Holocene Period, from roughly 11,000 years before the present down to the present. In the Irasburg-to-Mosher's Tap corridor, there are many lake-associated wetlands, along with several existing and former small lakes, and archaeological sites may be associated with these fresh-water marsh communities.

However, no Native American sites have been recorded within the transmission-line corridor from Irasburg to Mosher's Tap. At Highgate, the closest known site to the substations is 1150 feet away. Two other sites have been found within 1.2 miles of the substations.

In spite of a rich Euroamerican history in the general area of St. Johnsbury and the Irasburg-to-Mosher's Tap corridor, no known European American archaeological sites within the project corridor are recorded in the Vermont Archaeological Inventory. No European American sites are known to exist in the Highgate project area or at the St. Albans project site.

Finally, no Paleontological sites were identified in any project area.

ENVIRONMENTAL IMPACTS

Effects of the Proposed Action and Mitigation Measures

The likelihood of the proposed project to cause potentially significant impacts is dissipated by design and mitigation measures that would be implemented as part of the proposed project. Table ES-1 summarizes potential environmental effects of the project and the design or mitigation measures that are proposed to avoid or eliminate adverse effects. The mitigation measures have been incorporated into the project as conditions of approval to mitigate or avoid environmental impacts that could result from implementation of the proposed project. Accordingly, the project would not result in unavoidable, significant adverse impacts.

Table ES-1: Summary of Monitoring and Mitigation Considered as Project Conditions				
Impact Type	**Impact**	**Mitigation Measure**	**Level of Significance Without Mitigation**	**Level of Significance With Mitigation**
Air Quality	Fugitive dust emissions	**4.1.1; 4.3.1.** Much of the construction will take place in Winter; therefore, snow cover and frozen ground will lead to little dust being generated. When dust control is needed, water and calcium chloride will be applied. Construction vehicles will maintain a speed limit of 25 mph on dirt and gravel surfaces.	Potentially significant	Not significant
Land Features and Use	Soil erosion	**4.1.2; 4.3.2.** Erosion controls, such as hay-bale fences, silt dikes, and mats, will be used.	Potentially significant in specific areas	Not significant
Land Features and Use	Soil compaction	**4.1.2.** VELCO will rake or plow where necessary to support vegetation or prevent ponding or runoff.	Not significant	Not significant
Land Features and Use	Agriculture	**4.1.2; 4.3.2.** Disruption to agriculture will be mitigated by use of taller poles, which allow for longer spans, and by consulting with farmers as to pole placement.	Not significant	Not significant
Hydrology, Water Quality and Water Use	Rivers and streams	**4.1.3; 4.3.3.** VELCO will follow its normal vegetation-management protocol, which does not allow spraying of herbicides within 30 feet of standing water. Shrubs will be maintained along rivers and streams to avoid adverse impacts to surface water.	Potentially significant	Not significant
Hydrology, Water Quality and Water Use	Private wells	**4.1.3; 4.3.3.** VELCO will not allow any herbicide application closer than 100 feet to private wells.	Potentially significant	Not significant

Table ES-1: Summary of Monitoring and Mitigation Considered as Project Conditions				
Impact Type	**Impact**	**Mitigation Measure**	**Level of Significance Without Mitigation**	**Level of Significance With Mitigation**
Ecology	Fisheries	**4.1.4; 4.3.4.** Shrubs will be maintained along rivers and streams to provide shade to the waters, so that cold-water fisheries will not be adversely affected.	Potentially significant	Not significant
Ecology	Wetlands and flora	**4.1.4; 4.3.4.** Wetlands will be protected by silt fences. At Highgate Substation, some vegetation and a 0.91-acre wet pasture will be removed; however, plants on the undisturbed part will be carefully maintained in their present state, and VELCO will comply with the conditions imposed by the U.S. Army Corps of Engineers General Permit No. 58. VELCO will avoid the State-listed endangered plant on one project site, *Juncus greenei.*	Potentially significant	Not significant
Socioeconomics	Communities and individuals	**4.1.5; 4.3.5.** VELCO will encourage contractors to hire locally when possible. VELCO has communicated and will communicate with town selectboards and planning commissions, landowners and State agencies. VELCO, or its consultant, will approach each affected landowner if a reasonable change in pole placement, within the ROW, could mitigate impacts.	Not significant	Not significant

Table ES-1: Summary of Monitoring and Mitigation Considered as Project Conditions				
Impact Type	**Impact**	**Mitigation Measure**	**Level of Significance Without Mitigation**	**Level of Significance With Mitigation**
Visual Resources	Visual aesthetics	**4.1.6; 4.3.6.** VELCO will screen the clearing close to the Djanikian and Bennett residences by planting pines along the edge of the lawn, if acceptable to the landowners. VELCO will use selective cutting in the clearing to reduce the exposure of the hillside. VELCO will allow other species to grow selectively and introduce additional plants at the transmission corridor on the hillside above the Djanikian and Bennett properties.	Potentially significant	Not significant
Visual Resources	Visual aesthetics	**4.1.6; 4.3.6.** VELCO will consult affected landowners on pole placements, which present an opportunity to move poles a short distance to mitigate any impact. Where wood or laminated poles cannot be used, VELCO will use Corten steel poles that oxidize and blend into the surrounding environment.	Potentially significant	Not significant
Visual Resources	Visual aesthetics	**4.1.6; 4.3.6.** VELCO will plant White Pines to fill the 100-foot right-of-way at the beginning and end of the clearing on Mosher's property to screen their view of the line. The existing VELCO access drive at the Highgate Substation will be graded, seeded and screened by planting conifers. Also, VELCO will plant a 4- to 5-foot cedar hedge along the south and east side of the substation.	Potentially significant	Not significant

Table ES-1: Summary of Monitoring and Mitigation Considered as Project Conditions				
Impact Type	**Impact**	**Mitigation Measure**	**Level of Significance Without Mitigation**	**Level of Significance With Mitigation**
Cultural Resources	Potential to affect undiscovered resources	**4.1.7; 4.3.7.** If unanticipated archaeological or human remains are encountered during construction, all construction will be halted in that area and the remains protected intact until the Vermont Division of Historic Preservation decides if further mitigation is necessary.	Potentially significant	Not significant
Cultural Resources	Potential to affect Native Americans	**4.1.7; 4.3.7.** Mr. Douglas Frink of Archaeological Consulting Team presented the project to April Rushlow of the Abenaki people; she did not identify any cultural resources that would be affected or raise other concerns.	Not significant	Not significant
Health and Safety	Noise impacts of construction	**4.1.8; 4.3.8.** The audible noise level, due principally to the synchronous condensers if installed at Highgate Substation, would be less than 55 dBA at the property line (which compares to the typical noise level in a suburban living room).	Not significant	Not significant
Health and Safety	Herbicide use	**4.1.8; 4.3.8.** VELCO will only use those pesticides and herbicides that are approved by the U.S. Environmental Protection Agency and the Vermont Agency of Agriculture, upon the advice of the Vermont Pesticide Council. All state regulations will be followed for herbicide application near open water, wetlands and water supplies or homes. The public will be notified in advance of herbicide application.	Potentially significant	Not significant

Table ES-1: Summary of Monitoring and Mitigation Considered as Project Conditions				
Impact Type	**Impact**	**Mitigation Measure**	**Level of Significance Without Mitigation**	**Level of Significance With Mitigation**
Health and Safety	Electro-magnetic fields (EMF)	**4.1.8; 4.3.8.** At peak loads, the predictable EMF level at the right-of-way's edge is 16 mG which is well below any existing U.S. standard.	Not significant	Not significant
Nuisance	Radio and Television Interference	**4.1.8; 4.3.8.** No interference is anticipated; however, should any occur, VELCO will work with nearby homes and businesses complaining of interference to determine the cause and mitigate any interference.	Not significant	Not significant

Cumulative Impacts

NEPA requires that potential, cumulative impacts be assessed. The discussion of cumulative impacts in Chapter 4 of this EA describes the potential cumulative impacts for each resource topic, such as cumulative air-quality impact at all sites and cumulative impacts on agriculture, forestry and wildlife habitat relative to the total availability of these resources in the area.

Most of the project's effects will be temporary, such as the potential impacts associated with construction. Many of the long-term effects are either not additive to the effects of other projects, or are so minor as cumulatively to not be significant, and the project will be sited entirely at substation sites or power-line corridors that exist today.

Unavoidable Adverse Effects

Unavoidable adverse effects related to the project are described in Chapter 4. There would not be any unavoidable adverse impacts by virtue of the inclusion of the above-listed design and mitigation measures as conditions of the proposed action.

Irreversible/Irretrievable Commitment of Resources

Irreversible and irretrievable commitment of resources is described in Chapter 4. The project would not cause any irreversible or irretrievable commitments of resources since substations and power lines may be removed in the future and their sites restored to natural conditions.